

**BY ORDER OF THE COMMANDER
309TH MAINTENANCE WING**

**309TH MAINTENANCE WING MANUAL
63-501**



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***AEROSPACE MAINTENANCE
QUALITY SYSTEM (AMQS)***

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This manual establishes the policies and requirements that define the 309th Maintenance Wing (309 MXW) quality management system AMQS. The AMQS supports the requirements of Air Force Instruction (AFI) 21-101 Air Force Materiel Command Supplement (AFMCSUP) 309 MXW Guidance Memorandum (GM) 21-03, *Aircraft and Equipment Maintenance Management*; Air Force Materiel Command Instruction (AFMCI) 63-501, *AFMC Quality Assurance*; Hill Air Force Base (AFB) Manual 63-501, *Quality Management System*; Aerospace Standard AS9100C, *Quality Management Systems - Requirements for Aviation, Space and Defense Organizations*; Aerospace Standard AS9110A, *Quality Management Systems - Requirements for Aviation Maintenance Organizations*, and International Standard ISO 9001, *Quality Management Systems - Requirements*. This manual is structured in the same manner as the AS9100C/AS9110A standards for ease of cross reference and compatibility with the standards' requirements. This document also supports requirements mandated by numerous other Air Force (AF) and Air Force Materiel Command (AFMC) policies and directives that are critical to depot maintenance and the 309 MXW mission. The AMQS is applicable to all organic, contract and Depot Maintenance Inter-service Support Agreement (DMISA) maintenance workloads, and applies to all 309 MXW organizations and personnel whose functions and activities have an impact on the quality, cost, and schedule of products produced. Internal and higher authority directives relevant to this manual are listed in **Attachment 1**. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with (IAW) Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of IAW the AF Records Disposition Schedule (RDS) located at <https://www.my.af.mil/afrims/afrims/afrims/rims.cfm>. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the Air Force Information Management Tool (AF IMT) 847,

Recommendation for Change of Publication; route AF IMTs 847 from the field through the chain of command of all groups affected by proposed changes.

This manual incorporates the requirements of ISO9001:2008. It has been written to establish the policy changes necessary to comply with AS9100C and AS9110A requirements. As such, it must be read in its entirety.

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1. Introduction: Hill AFB is an AFMC base located in Northern Utah. Hill AFB is home to many operational and support missions with the Ogden Air Logistics Center (OO-ALC) serving as the host organization. As a component of OO-ALC, the 309 MXW provides depot repair, modification, and maintenance for the Department of Defense (DoD) aircraft, and the intercontinental ballistic missiles. The wing also overhauls and repairs landing gear, wheels and brakes for AF aircraft, rocket motors, air munitions and guided bombs, photonic equipment, training devices, electronics, avionics, instruments, hydraulics, power systems, software, and other aerospace related components. The 309 MXW employs its AMQS to establish and maintain a standardized approach to achieve excellence in supporting the maintenance mission through a focus on process certification, process surveillance, and configuration management. The AMQS drives and requires leadership involvement and engagement at all levels to ensure its success. The AMQS enables our organization to perform aerospace maintenance with defined, controlled, and repeatable processes using a systems approach developed by the wing.

1.1. Scope: The 309 MXW is organized in a hierarchical structure composed of seven groups providing support to wing customers, and a support staff that includes engineering, quality, personnel, finance, and business development offices. All functions and organizations directly align to the 309 MXW, thereby reporting directly to the 309 MXW Commander (CC) and Vice Director (DV). This structure, lines of authority, and communication ensures all management system related issues are appropriately addressed. The following describes each group's mission and responsibilities:

1.1.1. The 309th Aircraft Maintenance Group (309 AMXG): Executes and delivers programmed depot maintenance packages, fighter aircraft modifications, and overhauls military aircraft as directed. In addition, provides military expeditionary depot maintenance and aircraft battle damage repair capabilities.

1.1.2. The 309th Missile Maintenance Group (309 MMXG): Depot repair, overhaul and maintenance of tractors and trailers, missiles, target boosters, radomes and shelters, propulsion system rocket engine, storage of missiles, propellant testing, and strategic missile integrated complex (SMIC) verification.

1.1.3. The 309th Electronics Maintenance Group (309 EMXG): Provides repair, overhaul, and modification for electronics, avionics, radar, navigational, laser guidance systems, instrumentation, photonics, airborne and ground generators, and electrical systems and components. Supports programmed depot maintenance and modification of aircraft weapons systems and worldwide re-supply support for component parts. The 309 EMXG is designated the technical source of repair for the AF Metrology and Calibration (AFMETCAL) program on assigned systems and components, and manages the Support Center Pacific (SCP), Kadena, Air Base, Japan.

1.1.4. The 309th Software Maintenance Group (309 SMXG): Designs and develops software in support of sustainment of operational flight programs, automatic test equipment, mission planning software, space and C3I systems, and other weapons systems. The 309 SMXG develops engineering test stands and other hardware necessary for use in the development and test of software.

1.1.5. The 309th Maintenance Support Group (309 MXSG): Performs maintenance of industrial plant equipment and facilities, lifting devices, and real property. Manages the wing tool control program. Supports facility engineering for all 309 MXW facilities. Provides scientific and engineer support, non-destructive testing, first article testing, and material/chemical property analysis for customers across 309 MXW, DoD, and other United States Government activities worldwide.

1.1.6. The 309th Commodities Maintenance Group (309 CMXG): Provides maintenance, repair, manufacturing and modification of landing gear, wheels and brakes; hydraulics, pneudraulics and armament power systems, gas turbine engines, auxiliary power units, secondary power units, fuel accessories and controls, aircraft structures, advanced composites, and local manufacturing. The 309 CMXG is designated as the technical repair center for landing gear, wheels and brakes, hydraulics and pneudraulics and composites.

1.1.7. The 309th Aerospace Maintenance and Regeneration Group (309 AMARG): Provides depot regeneration, modification and maintenance for the Phantom (F-4),

Fighting Falcon (F-16), Thunderbolt (A-10), Hercules (C-130), and Orion (P-3) aircraft, and the tooling to support these aircraft. Occupying 2,600 acres (4 square miles) of desert southeast of Tucson, Arizona, 309 AMARG manages an inventory of more than 4,400 aircraft, 32 aerospace vehicles, and 350,000 line items of aircraft production tooling. In addition to the historic storage and disposition mission, the centers highly skilled workforce regenerates aircraft, returning them to flying status or preparing them for overland shipment. The 309 AMARG team also reclaims hundreds of millions of dollars worth of parts to support global war-fighting operations.

1.1.8. The 309th Business Operations (309 MXW/OB): Provides oversight of depot maintenance policies and procedures; Depot Maintenance Activity Group (DMAG) financial matters; contract management; manpower determination; workload requirements, execution & production; partnering; new workload activation; strategic plans and analysis; and special studies that relate to industrial/production operations. Responsible for balance of skills through career and workforce development. Provides material, planning, scheduling, and base engine management support functions. Liaises with the center training office on maintenance training matters as applicable. Provides contract services for the wing.

1.1.9. The 309th Engineering (309 MXW/EN): Senior engineer responsible for science and engineering support, and expertise on technical aspects of organic DMAG operations. Ensures chief engineers and scientists assigned to each group execute their responsibilities appropriately. Serves as the wing functional guardian for all scientists, engineers, and engineering technicians to include professional development, establishment of career paths, and proper technical skills mix. Serves as the wing focal point for technology insertion activities.

1.1.10. The 309th Quality Program (QP) Office (309 MXW/QP): The wing focal point for quality assurance programs and environmental, safety and occupational health (ESOH) activities to assist the production groups in achieving technical and process compliance in their products and services.

1.2. Application: There is an exclusion to AS9100C and AS9110A taken by the 309 MXW. The following information is provided to clarify applicable activities.

1.2.1. The 309 MXW has neither responsibility nor authority to select, approve, or re-approve suppliers. These activities are conducted by various AF organizations outside of the 309 MXW control, which include but are not limited to the contracting directorate and the Defense Contract Management Agency (DCMA). This exclusion does not affect the organization's ability or responsibility to provide products that meet customer and/or regulatory requirements (see paragraph 7.4.2.).

2. Normative Reference:

2.1. Glossary of References and Supporting Information is found in [Attachment 1](#) to this document.

3. Terms and Definitions:

3.1. Throughout the text of this manual, wherever the term "product" occurs, it can also mean "service."

3.2. Terms and Definitions are found in [Attachment 1](#) to this document.

4. AMQS:

4.1. General Requirements:

4.1.1. The 309 MXW establishes, documents, implements and maintains a management system, and continually improves its effectiveness IAW requirements outlined in DoD, AF, and AFMC governing documents.

4.1.2. Management system approvals, certificates, ratings, licenses, and permits required by applicable statutory, regulatory and customer requirements are maintained by the applicable wing/group functional offices.

4.1.3. Direction and guidance for determining the processes of the management system, their sequence, interaction, criteria for effective control and operation, are found in the primary governing documents for maintenance management. Guidance for ensuring the availability of resources, and the information to support, monitor, measure, and analyze the wing's processes are also found in the primary governing documents.

4.1.4. A depiction of the process interaction within the management system is shown in 309 MXW Process Flow with reflecting current AS9100/AS9110 requirements ([Attachment 4](#)), and the 309 MXW Macro Business Map ([Attachment 3](#)).

4.1.5. Outsourced processes affecting product conformity are controlled IAW management system requirements (see paragraph 7.1.5.).

4.2. Documentation Requirements:

4.2.1. General: The wing has established a documented safety/quality policy statement and safety/quality goals and objectives. References to the documented procedures and records required by the current revision of applicable aerospace standards are found in the appropriate sections of this manual. Documents and records needed by the wing to ensure effective planning, operation, and control of its processes are located in the affected work areas.

4.2.1.1. Personnel have access to management system documentation and procedures through hardcopies and/or the use of electronic media located on AF, command, wing, and local intranet web pages. Personnel verify currency of regulatory documents prior to use.

4.2.1.2. The primary governing documents for documentation requirements are AFI21-101, *Aircraft and Equipment Maintenance Management*; AFI21-101_AFMCSUP, *Aircraft and Equipment Maintenance Management*; AFI21-102, *Depot Maintenance Management*; AFI33-360, *Publications and Forms Management*; AFMCI21-156, *Operational Work loading, Planning and Scheduling Control*; AFMCI63-501; Technical Order (TO) 00-5-1, *Air Force Technical Order System*; TO 00-20-1, *Airspace Equipment Maintenance Inspection, Documentation, Policy and Procedures*; and AFMCI 21-127 *Depot Maintenance Plant Management*.

4.2.2. Quality Manual: This document serves as the 309 MXW's management system quality manual.

4.2.3. Control of Documents:

- 4.2.3.1. Documents required by the management system are controlled. Documented procedures exist for approval of documents prior to issue, review, updating, identification of changes, current revision status, and the means to prevent unintended use of obsolete documents. Relevant versions of documents including those of external origin are available in the areas requiring their use. Wing, group, and squadron publications and forms program managers review and coordinate publication requirements for locally developed documents.
- 4.2.3.2. The primary governing documents for control of documents are AFI33-360; TO 00-5-1; TO 00-5-3, *AF Technical Order Life Cycle Management*; TO 00-20-1; 309MXWI91-201, *Explosive Safety Program Plan*; AFMAN91-201, *Explosives Safety Standards*; HILLAFBI99-103, *OO-ALC Test and Evaluation (T&E) Process*; and AFI21-101_AFMCSUP_309MXWGM21-03.
- 4.2.4. Control of Records: AF level procedures are followed for the control, identification, storage, protection, retrieval, retention, and disposition of records.
- 4.2.4.1. Supplier records generated by government contracts are retained for the life of the contract for quality assurance purposes.
- 4.2.4.2. The primary governing documents for control of records are AFI33-322, *Records Management Program*; AFI33-360; AFI 33-364, *Records Disposition - Procedures and Responsibilities*; and AFMAN33-363.

5. LEADERSHIP RESPONSIBILITY:

5.1. Leadership Commitment:

- 5.1.1. Senior leadership will provide evidence of their commitment to implementation and improvement of the management system's effectiveness by communicating the importance of meeting customer, statutory and regulatory requirements; establishing the wing safety/quality policy statement; establishing safety/quality goals and objectives; conducting management reviews; and ensuring required resources are available.
- 5.1.2. Leadership at all levels will promote a culture of communication, teamwork, integrity, and trust in its people; to ensure that personnel have the capability and resources to produce products of the highest quality. Continuous process improvement (CPI) is achieved through the encouragement and support of the workforce suggestions, management response to corrective and preventative actions, audit results, customer complaints, baseline compliance improvement event (BCIEs), and management reviews.

5.2. Customer Focus:

- 5.2.1. Senior leadership ensures customer expectations and requirements are met through strict adherence to technical data and contractual requirements with the intent of enhancing customer satisfaction. Senior leadership ensures product conformity and on-time delivery performance metrics are reviewed and measured during Program Management Review (PMRs), and Quality Management Review (QMRs), and appropriate correction, corrective or preventative actions are taken if planned results are not or will not be achieved.

5.3. Wing Safety/Quality Policy Statement: (see [Figure 1.1](#))

Figure 1.1. Safety/Quality Policy

The 309 MXW will create/sustain an environment and employ processes that ensure personnel safety, while creating quality products and services. We will also ensure our products fully conform to all safety specifications provided by our customers. These efforts will enable us to consistently produce high quality products to fill warfighter requirements on time, at the best value, while continually improving our Aerospace Maintenance Quality System (AMQS).

5.3.1. Senior leadership has developed this policy statement and ensures that it is appropriate to the purpose of the wing's mission; that it includes a commitment to comply with requirements and continually improve the effectiveness of the management system. It provides a framework for establishing and reviewing the 309 MXW safety/quality goals and objectives and is communicated and understood throughout the wing. This policy statement is periodically reviewed for suitability during the wing's strategic planning sessions.

5.3.2. Wing, group, and squadron commanders/directors will communicate the safety/quality policy statement across the wing and may use visual aids, briefings, meetings, e-mail, bulletins, and any other methods. Leadership will ensure personnel are aware of the relevance and importance of their activities, and how they contribute to the overall wing objectives.

5.3.3. Group directors will provide an individual whose primary responsibilities are to assist wing, group, and squadron leadership with ensuring all management system requirements are effectively implemented and conform to the requirements of this manual, working in tandem with the wing AMQS program office.

5.3.4. The 309th Maintenance Training Flight will maintain annual management system refresher and new hire training, with completion records tracked in the Training Scheduling System (TSS).

5.4. Planning:

5.4.1. 309 MXW Safety/Quality Goals and Objectives:

5.4.1.1. The wing workloading/production office maintains current copies of the quality goals and objectives, including product safety and personnel safety objectives. The objectives are organized into four categories: people, process, performance, and resources. Senior leadership will ensure the objectives are measurable, established at relevant functional levels, and are consistent with the wing's safety/quality policy statement. The measurable results will be reviewed and documented during scheduled management meetings (e.g., PMR, strategic offsite).

5.4.2. Management System Planning: The wing's management system is defined in DoD and AF requirements. When changes are mandated affecting the management system, senior leadership will ensure the integrity of the management system through planning and phased implementation. Strategic planning sessions such as monthly strategic meetings and quarterly off-site meetings are the primary means for management system planning. Management system integrity is maintained when changes occur by adherence to higher headquarters regulatory requirements.

5.4.3. Safety Objectives:

5.4.3.1. See paragraph 5.4.1.2.

5.5. Responsibility, Authority and Communication:

5.5.1. Senior leadership will utilize this manual, job descriptions, management meetings, organizational charts, and other procedures/documents to define and communicate the responsibilities and authorities within the wing. The 309 MXW Operating System Model ([Attachment 2](#)) illustrates the organizational structure in regards to general reporting and areas of responsibility.

5.5.1.1. Accountable Executive Manager: The 309 MXW Business Office Chief serves as the accountable executive manager, who ensures that all necessary resources are obtained to complete and finance any required maintenance IAW all organization, customer and authority requirements.

5.5.1.2. Maintenance Manager: Each group commander/director serves as a maintenance manager, who is responsible for assuring that all maintenance required is carried out IAW all wing, customer, and authority requirements.

5.5.2. Management Representative: The 309 MXW Technical Director serves as the management representative, who irrespective of other responsibilities, has the responsibility and authority to ensure processes needed for the management system are established, implemented and maintained. Reports to senior leadership on the performance of the management system, and any need for improvement. Ensures the promotion of awareness of customer requirements throughout the wing; and the organizational freedom and unrestricted access to top management to resolve matters pertaining to the management system.

5.5.3. Internal Communication: Leadership will ensure appropriate and effective communication processes are established and maintained. The established communication process allows information to flow upwards, downwards, and laterally. The following communication methods used are, but are not limited to, production meetings, weekly management meetings, director calls, town hall meetings, newsletters, e-mails, memos, intranet sites, and SharePoint sites.

5.6. Management Reviews:

5.6.1. General: Senior leadership will review the management system, according to the management review battle rhythm to determine adequacy and effectiveness of the management system. The management review battle rhythm is organized by four main categories: people, process, performance, and resources. Management reviews consist of the strategic planning off-sites, wing staff meetings, QMR, PMR, configuration management board, etc. During management review meetings, senior leadership will determine opportunities for improvement and the need for changes to the management system. This will include a periodic review of the suitability, adequacy, and effectiveness of the 309 MXW Safety/Quality Policy Statement, and safety/quality goals and objectives. Management system reviews are used to assess the health and well-being of various aspects of the management system and associated processes.

5.6.1.1. Senior leadership will address the various functions of the management system (e.g., setting and monitoring business and improvement goals, risk

management, authorization of projects and initiatives, commitment of resources, approval of production process improvement plans, transformation efforts, approval of the costs and schedules for improvement projects, and resource allocations).

5.6.2. Management Review Inputs:

5.6.2.1. Inputs must include results of audits, customer satisfaction, process performance (e.g., squadron inspection program [SQIP], quality assurance [QA], BCIE, PMR), status of corrective action request (CARs) and preventive action request (PARs), follow-up actions from previous reviews, changes affecting the management system, recommendations for improvement, and requests for corrective actions from authorities and customers. Inputs also include the achievement, adequacy, and effectiveness of the personnel training program, and higher authority requirement changes impacting the wing.

5.6.3. Management Review Output:

5.6.3.1. Decisions and actions will relate to improvement of the effectiveness of the management system and its processes, improvements of products related to customer requirements, and the resources needed. Senior leadership's decisions and actions will be documented and tracked. Records may include briefing slides, minutes, rosters, and/or actions. Copies of records are found on the wing's SharePoint site to provide a history. These decisions and outputs result in the continual improvement of the overall management system.

5.7. Safety Policy Statement:

5.7.1. See paragraph 5.3.

6. RESOURCE MANAGEMENT:

6.1. Provision of Resources:

6.1.1. Leadership at all appropriate levels determines and provides resources needed to implement and maintain the management system.

6.1.2. The primary governing documents for provision of resources are AFMCI21-129, *Depot Maintenance Management*, *Depot Repair Enhancement Process (DREP)*; AFMCI21-130, *Depot Maintenance Materiel Control*; AFMCI21-156; AFMCI63-1201, *Implementing Operational Safety Suitability and Effectiveness (OSS&E) and Life Cycle Systems Engineering (LCSE)*; and HILLAFBI65-602, *Resource Management System (RMS)*.

6.2. Human Resources:

6.2.1. Personnel performing work effecting conformity to product requirements both directly and indirectly, are required to be competent on the basis of appropriate education, training, skills, and experience. Appropriate qualifications/certifications are acquired and maintained IAW AF requirements.

6.2.2. Competence Training and Awareness:

6.2.2.1. The civilian training plan (CTP) outlines the specific training and necessary competency requirements for personnel performing work affecting product

conformity. These requirements are determined based on regulatory requirements, such as Occupational Safety and Health Administration (OSHA) standards, AF Occupational Safety & Health (AFOSH) standards, AF instructions, technical data, the applicable workload, job series, and level of experience for the work being performed. The wing's maintenance training program and subsequent courses communicate these requirements and qualify personnel for competency through the use of on-the-job training (OJT), structured on-the-job training (SOJT), and formal classroom training. Managers and supervisors evaluate subordinate's job performance following formal training, OJT, SOJT, and developmental assignments for effectiveness. Supervisors and managers are responsible for initial certification, decertification and recertification. Certification requires completion of all necessary training and proficiency demonstration to a qualified trainer. Once certified, employees are competent to perform maintenance operations without oversight. Employees can be decertified for administrative or workmanship reasons. Recertification may require re-training and always requires a proficiency demonstration. Certified employees are also subject to personnel evaluation (PEs) conducted by QA and qualifying officials, in order to evaluate competency and maintain certifications. Employees, supervisors, managers, and the wing maintenance training flight evaluate training curriculum continually, and as a minimum, a formal evaluation is completed triennially.

6.2.2.2. Personnel must obtain and maintain certification on workloads and tasks as required by governing authorities. Non-certified personnel are provided qualification training, and must demonstrate skill and proficiency for certification; prior to performing unsupervised maintenance services. Training monitors use TSS to schedule personnel for initial and recurring training based on their specific CTP for procedures, changes to authority requirements, technical knowledge, and human factors. Additionally, TSS tracks the accomplishment of training for future metrics. The TSS-Production Acceptance Certification (PAC) System is the primary system used to manage the results and records of training, and evaluation of competency of tasks performed. Training/qualification requirements are identified and applied in TSS-PAC/Electronic Training Record (ETR).

6.2.2.3. Through various briefings such as commander/director calls and shop meetings, personnel are made aware of the relevance and importance of their activities and how they contribute to the achievement of the quality objectives.

6.2.2.4. The primary governing documents for competence training and awareness are AFI21-101_AFMCSUP; AFI36-401, *Employee Training and Development*; AFI36-2232_AFMCSUP, *Maintenance Training*; AFMCI36-201, *Education and Training*; AFMC Policy Directive (PD) 36-2, *Education and Training*; AFMCI90-102, *Wellness of the Force*; AFI 21-123, *Air Force Repair Enhancement Program (AFREP)*; and Air Force Handbook (AFH) 36-2235V1, *Information for Designers of Instructional Systems – ISD Executive Summary for Commanders and Managers*.

6.3. Infrastructure:

6.3.1. The wing provides and maintains the necessary onsite resources and infrastructure to ensure production objectives are realized, and product conformance is maintained. 309

MXSG performs on-site maintenance of industrial facilities, equipment, lifting devices, and real property. The wing utilizes support services provided by the 75th Air Base Wing to include utilities, computer hardware and software, and communication media (i.e. phones, e-mail, and internet access). When the customer requests maintenance, repair, or overhaul services away from our primary fixed location, the wing ensures the infrastructure needed is available according to the applicable technical data.

6.3.2. The primary governing documents for infrastructure are AFI32-1024, *Standard Facility Requirements*; AFH32-1084, *Facility Requirements*; AFMCI21-127, *Depot Maintenance Plant Management*; AFMCI21-127_HILLSUP, *Depot Maintenance Plant Management*; AFMCI21-156; and 309 MXW Instruction (MXWI) 21-110, *Depot Facility Management*.

6.4. Work Environment:

6.4.1. Technical data defines the requirements for managing those elements of the work environment needed to achieve conformity to product requirements. A work hazard analysis is completed for all new and existing workloads. In the event there is insufficient or missing data contained in the technical data, a job safety analysis is accomplished to determine proper safety and personal protective equipment (PPE) requirements for dealing with the workload.

7. Product Realization:

7.1. Planning of Product Realization:

7.1.1. The wing plans and develops the processes needed for product realization based on product quality objectives and requirements. The wing will determine the processes, documents, and resources specific to the product. Monitoring and verification activities, inspection and test criteria and activities, and/or validation (prior to delivery) are used to ensure that products meet the customers' design and functionality requirements. Planning also considers identification of resources to support the operation and maintenance of the product. Planning provides appropriate and suitable records to demonstrate that the product (or service) has met specified requirements. Planning also takes into consideration all applicable customer specifications addressing safety requirements of the product.

7.1.1.1. The primary governing documents for planning of product realization are AFI21-101_AFMCSUP; AFI21-101_AFMCSUP_309MXWGM21-03; AFMCI21-105, *Depot Maintenance Work Measurement*; AFMCI21-130; AFMCI21-127; AFMCI21-127_HILLSUP; AFMCI21-129; AFMCI21-156; TO 00-5-1; TO 00-5-3; and TO 00-5-15, *Air Force Time Compliance Technical Order Process*. **NOTE:** For 309 SMXG only: Project Planning Policy and Project Planning Process.

7.1.2. Project Management (AS9100C/AS9110A Clause 7.1.1):

7.1.2.1. The 309 MXW plans and manages product realization in a structured and controlled manner to meet requirements at accepted risk, and within resource and schedule constraints. The process for planning and managing product realization in a controlled manner is broken down into 3 stages. Stages 1 and 2 describe the System Program Office (SPO) and the Global Logistics Support Center (GLSC) roles and

responsibilities for defining requirements and reviewing supportability for product realization. In Stage 3, the 309 MXW works directly with the SPO and GLSC to review the requirements, conduct a pre-production planning team (PPPT) meeting, and translate the workload into people, material, and/or service requirements. The 309 MXW then validates part supportability, shop capacity, and work scope planning prior to conducting a production planning team (PPT) meeting. As we move from project planning to project management, product realization is managed through the daily execution management plan, daily team meetings, leadership monitoring execution to the plan, the use of over and above recover plans (if applicable), weekly production meetings, monthly team reviews (squadron review), squadron corporate board meetings (squadron to group review), and the AMQS/CPI rack and stack.

7.1.2.2. The primary governing documents for project management are AFMCI21-156, AFI21-101_AFMCSUP, and AFI21-101_AFMCSUP_309MXWGM21-03. **NOTE:** For 309 SMXG only: Integrated Project Plan (IPP).

7.1.3. Risk Management (AS9100C/AS9110A Clause 7.1.2):

7.1.3.1. Risk management is a continuous, forward-looking process that is part of project management and addresses issues that could endanger achievement of critical objectives. Risk management is used to identify potential problems before they occur. Risk handling activities are planned and invoked as needed across the life of the product or project to mitigate adverse impacts on achieving objectives. A continuous risk management approach effectively anticipates and mitigates risks that can have a critical impact. The processes for assignment of responsibility and managing risk are contained in governing AFIs and are controlled and mitigated through CPI efforts throughout product realization.

7.1.3.2. The primary governing documents for risk management are AFI90-901, *Operational Risk Management*; Air Force Pamphlet (AFPAM) 90-902, *Operational Risk Management (ORM) Guidelines and Tools*; and AFMCI21-129. **NOTE:** For 309 SMXG only: Risk Management Policy, Risk Management Process, Planning Template and Risk Management Tool.

7.1.4. Product Configuration Management (AS9100C/AS9110A Clause 7.1.3.):

7.1.4.1. Configuration management for end-items resides with the engineering authority and is conveyed to the 309 MXW through official technical data. With the exception of 309 SMXG and 309 MXSG, the groups are a source of repair, modification, or overhaul. The 309 MXW does not establish the configuration of end-items; however, integrity of the product configuration is maintained by adhering to AF Configuration Management policy and procedures set by the weapons system engineering authority, and appropriate weapon systems technical data.

7.1.4.2. Pre-production or non-configured items accepted into the AF inventory will be operated and maintained according to the latest technical data developed (TOs, commercial-off-the-shelf [COTS] manuals, process orders, contractor data, etc.), which is compatible with the specified equipment. Approved technical data is the only authorized source of specifications used to perform work or to develop local instructions to accomplish technical requirements.

7.1.4.3. For changes to maintenance processes refer to paragraph 7.5.1.2.

7.1.4.4. The primary governing documents for configuration management are AFMCI21-156; AFI21-101_AFMCSUP; AFI21-101_AFMCSUP_309MXWGM21-03; AFMCI63-501; Military Handbook (MIL-HDBK) 61A, *Configuration Management Guidance*; EIA-649-B, *Configuration Management Standard*; and ISO 10007, *Quality Management Systems – Guidelines for Configuration Management*.

7.1.5. Control of Work Transfers (AS9100C/AS9110A Clause 7.1.4):

7.1.5.1. Outsourced work or work temporarily conducted outside 309 MXW facilities is planned and controlled by contractual agreement or by public/private partnership agreement as required by United States Code Title 10, Section 2464 (commonly referred to as 50-50).

7.2. Customer-Related Processes:

7.2.1. Determination of Requirements Related to the Product:

7.2.1.1. Customer requirements are determined from technical data, contractual requirements, workload planning, AFMC, OO-ALC, and 309 MXW policies and procedures. Contract requirements and other interests as defined by the customer are negotiated and funded through the system program managers (e.g., Memorandum of Understanding [MOU], Memorandum of Agreement [MOA], and service-level agreements). Requirements are reviewed at levels appropriate to the group, or elevated to a higher level if necessary.

7.2.1.2. Tasks related to identifying requirements related to the product are based on requirements specified by the customer (including the requirements for delivery and post-delivery); derived requirements not specified by the customer, but necessary for intended use if known; obligations applicable to product (including regulatory and statutory requirements); any additional requirements considered necessary on the work being performed.

7.2.2. Review of Requirements Related to the Product:

7.2.2.1. Senior leadership ensures depot level maintenance requirements are evaluated and scheduled for accomplishment. The PPPT conducts workload negotiations, including pre-quotation activities (i.e., rough order of magnitudes, etc.) with coordination or input from representatives directly involved in the workload (production, production planning, process engineering, program management, risk management, contracting, quality assurance, purchasing, scheduling and inventory management, and/or control functions and other functions as required). Requirements differing from considerations appearing in the customers offer are resolved prior to contract implementation.

7.2.2.2. The capability to fulfill customer requirements is determined by the group responsible for meeting those requirements, or delegated to a squadron within the group having sufficient technical knowledge to determine capabilities and evaluate anticipated risks associated with the workload.

7.2.2.3. Where the customer's statement of requirements is incomplete, the requirements are established from available technical data and confirmed before

acceptance. This information is entered into internally generated work control document (WCDs), work authorization document (WADs), process orders, and/or project plans.

7.2.2.4. Where product requirements are changed, the wing ensures relevant documents are amended, and relevant personnel are made aware of the changed requirements. This includes customers or regulatory agencies per contract requirements.

7.2.2.5. Results of the reviews, pertinent related correspondence, and necessary follow-up actions are recorded on WCDs, process orders, project definitions, etc.

7.2.2.6. The primary governing documents for review of requirements related to the product are AFI21-101_AFMCSUP_309MXWGM21-03, and AFMCMAN21-1, *Air Force Materiel Command Technical Order System Procedures*.

7.2.3. Customer Communication:

7.2.3.1. The 309 MXW implements effective arrangements for communicating with customers in relationship to product information, inquiries, orders, contracts or amended requirements, and feedback including customer complaints. Some methods in place include the internet, 24-hour contact points, customer service offices, program and weapon system reviews, and deficiency report action offices.

7.2.3.2. The primary governing document for customer communication is AFMCI21-129.

7.3. Product Design and Development:

7.3.1. Product design and development is only accomplished in 309 SMXG, and uses a system which implements the best practices from Capability Maturity Model Integration (CMMI), *Guidelines for Process Integration and Product Improvement*, the requirements from AS9100C, AS9110A, as well as customer requirements in conjunction with applicable AF, OO-ALC, wing and group requirements. **NOTE:** The wing develops process orders (see paragraph 7.5.1.2) to enhance repair solutions provided by the program office.

7.3.2. Projects compose their defined process by selecting one of 309 SMXG pre-approved lifecycles, the applicable standard support process (SSP), and one of the squadron's standard engineering process (SEPs). As a result, the project's defined process encompasses the entire lifecycle starting with project planning, required inputs and outputs, reviews, verification, validation, testing, required documentation, and design and development change control.

7.3.3. The primary 309 SMXG and squadron level documents for design and development are 309 SMXG policy for engineering development and support project management, the project process guide (PPG), and 309 SMXG and squadron level processes and templates.

7.4. Purchasing:

7.4.1. Purchasing Process:

7.4.1.1. A partial exclusion to AS9100C and AS9110A for the 309 MXW is required for supplier selection because the wing has no responsibility or authority to qualify or select suppliers. Excluding the requirements for selecting suppliers does not affect the 309 MXW ability or responsibility to provide products that meet both customer and applicable regulatory requirements.

7.4.1.2. Parts, services and materials used for depot repair, overhaul, modification, and maintenance within the wing are purchased through the Federal Supply System or predetermined sources.

7.4.2. Purchasing Information: The wing ensures purchasing information (requisitions) clearly describe the products to be procured. Typically this includes a clear description of the product and/or part number. The wing ensures adequacy of specified purchase requirements prior to their communication to the outsource supplier.

7.4.3. Verification of Purchased Product:

7.4.3.1. The wing ensures the product received meets requested requirements. This is accomplished primarily through a review of required documentation and product received. This may include tests, review and verification of part numbers, kit numbers and national stock numbers of the product received. Product is not used until it has been verified as meeting requirements.

7.4.3.2. Currently, no provisions for the wing are made to allow for on-site verification or customer verification at the supplier's premises. Where the contract specifies and reserves the right to verify that the subcontracted product conforms to specified requirements, the customer or the customer's representative is afforded the right to verify the conformance at the suppliers premises, or at 309 MXW premises.

7.4.3.3. Verification and approval of supplier's product by a customer does not absolve the wing of the responsibility to provide acceptable product, nor does it preclude subsequent rejection by the customer.

7.4.4. The primary governing documents for purchasing are AFI64-117, *Air Force Government-Wide Purchase Card (GPC) Program*; AFMCI65-101, *Depot Maintenance Accounting and Production System-Financial Policy and Procedures for Organic Depot Maintenance*; AFMCI21-130; and appropriate Federal Acquisition Regulations.

7.5. Production and Service Provision:

7.5.1. Control of Production and Service Provision: Senior leadership ensures all production and service is carried out under controlled conditions. WADs, TOs, engineering drawings, process orders, and COTS manuals describe product characteristics, special processes, criteria for workmanship, suitable tools, Test, Measurement and Diagnostic Equipment (TMDE), inspection/verification criteria, prevention, detection and removal of foreign object debris (FOD), control of utilities and supplies (e.g., compressed air, chemicals, proper lighting, work environment). Technical data libraries (e.g., Automated Technology Information Management System [ATIMS], Enhanced Technical Information Management System [ETIMS], Process Order Development and Display System [PODDS], and Joint Engineering Data Management Information and Control System [JEDMICS]) make available current work instructions at

point of use. WCDs/WADs account for all assets/end items during maintenance, provide record of compliance to customer and regulatory requirements, identify in-process inspection points, and provide record of accomplishment of all maintenance tasks.

7.5.1.1. New Maintenance Process Verification:

7.5.1.1.1. Depot activation processes are designed, qualified, approved, and documented IAW AF source of repair assignment (SORA) to ensure capabilities in performing maintenance, and compliance with established AF and customer requirements. Headquarters AFMC determines the source of repair. The system or component program managers prepare and submit the SORA to headquarters AFMC. SORAs assigned to the wing are processed through the depot activation office.

7.5.1.1.2. A representative item from the first production run of a new part or assembly will be used to verify that the production processes, production documentation and tooling are capable of producing parts and assemblies that meet requirements. This process shall be repeated when changes occur that invalidate the original results (e.g., engineering changes, manufacturing process changes, tooling changes).

7.5.1.1.3. The primary documents governing new maintenance process verification are AFI63-101, *Acquisition and Sustainment Life Cycle Management*; and 309MXWI21-111, *Depot Activation*.

7.5.1.2. Control of Maintenance Process Changes:

7.5.1.2.1. Wing personnel utilize the AFMC Form 202, *Nonconforming Technical Assistance Request and Reply*, process to control and document changes affecting maintenance processes, equipment, tools, and/or software programs. Only the weapon system cognizant engineering authority is identified and authorized to approve changes to maintenance processes and product specifications. Wing and/or group process engineers must assess the results of process changes to confirm the desired effect has been achieved, without adverse affects to product conformity. Group process engineers are identified as the change approval authority for wing developed process orders.

7.5.1.2.2. The primary documents governing the control of maintenance process changes are AFMCMAN21-1, and AFI21-101_AFMCSUP_309MXWGM21-03.

7.5.1.3. Control of Maintenance Equipment, Tools and Programs:

7.5.1.3.1. Production/maintenance equipment, tools and software programs are validated prior to use, and maintained and inspected periodically according to established procedures and the appropriate TO for the equipment in use. Automated Test Equipment (ATE) has daily confidence tests plus a calibration test that is run at scheduled intervals listed in the applicable calibration and measurement summary (CMS). Validation prior to production use includes verification of the ATE.

7.5.1.3.2. Storage requirements, including periodic preservation/condition checks, are defined for production/maintenance equipment or tooling in storage.

7.5.1.3.3. The primary documents governing the control of maintenance equipment, tools and programs are AFMCI21-127; TO 00-20-1; TO 00-20-3, *Maintenance Process of Repairable Property and the Repair Cycle Asset Control System*; TO 00-20-14, *AF Metrology and Calibration Program*; TO 34-1-3, *Inspection and Maintenance of Machinery and Shop Equipment*; TO 1-1A-15, *General Maintenance Instructions for Support Equipment (SE)*; AFI21-101_AFMCSUP_309MXWGM21-03; and AFMCI21-120, *Organic Depot Field Teams*.

7.5.1.4. Post Delivery Support:

7.5.1.4.1. Post delivery support includes when applicable investigation and report of defect information using the Joint Deficiency Reporting System (JDRS). Defect trends are presented and reviewed in QMR meetings and, as needed, discussed with command headquarters. Deficiency report (DRs) are used to identify problems after delivery. Each DR is thoroughly investigated to determine the cause of the problem and appropriate corrections and corrective actions are accomplished. Control and updating of technical data is the responsibility of the SPO; however, the wing requests changes to technical data using the Air Force Technical Order (AFTO) Form 22, *Technical Manual (TM) Change Recommendation and Reply*, AFMC Form 202, and AFTO Form 252, *Technical Order Publication Change Request*, when required as a result of analysis of data and end user requests. Approved technical data determines how repairs are accomplished. If the technical data does not clearly define the entire process, locally developed process orders are used to approve and control the repair actions. All off-site work is accomplished IAW applicable technical data.

7.5.1.4.2. The primary governing documents for post delivery support are AFI21-101_AFMCSUP_309MXWGM21-03; AFMCI63-510_HILLAFBSUP_I, *Deficiency Reporting, Investigation and Resolution*; TO 00-25-107, *Maintenance Assistance*; TO 00-25-108, *Depot Support Communications - Electronics (C-E)*; TO 00-35D-54, *USAF Deficiency Reporting Investigation and Resolution*; TO 00-5-3; and AFMCMAN21-1.

7.5.2. Validation of Special Processes for Production and Service Provision:

7.5.2.1. Wing and group leadership shall ensure validation of any processes where the resulting output cannot be verified through subsequent monitoring and measurement. This includes any processes where deficiencies become apparent only after the product is in use, or the service has been delivered. These processes are often referred to as special processes. Special processes may include welding, soldering, adhesive bonding, heat treatment, corrosion control/protective coatings, nondestructive testing (NDI), and destructive testing. The wing uses certified operators, materials, equipment, and/or continuous monitoring and control of process parameters as directed by technical data to ensure that specified requirements are met. This includes qualification and approval of special processes prior to use and control of significant operations and parameters of special processes IAW technical data. Records of validation and revalidation are maintained in various information systems

such as Quality Information Management Standard System (QIMSS) and Maintenance 1.

7.5.2.2. The governing documents are dependent on the special process. Some examples are TO 33B-1-1, *Nondestructive Inspection Methods, Basic Theory*, and TO 33B-1-2, *Nondestructive Inspection - General Procedures and Process Controls*, for NDI processes; TO 00-25-234, *General Shop Practice Requirements for the Repair, Maintenance, and Test of Electrical Equipment*, for soldering; and TO 00-25-252, *Intermediate Maintenance and Depot Level Maintenance Instructions - Aeronautical Equipment Welding*, for welding.

7.5.3. Identification and Traceability:

7.5.3.1. All production must follow established procedures such as the 00 series TOs for serialized items to identify material/products from receipt and during all phases of production, delivery and installation. The wing maintains and ensures identification of the configuration of the product, in order to identify any differences between the actual configuration and the agreed upon document configuration. All personnel have an inherent responsibility to ensure both the accountability and control of supply items and components, and to ensure this information is tracked accurately.

7.5.3.2. The wing also identifies the status of product with respect to monitoring and measurement requirements through the use of WCDs/WADs.

7.5.3.3. When acceptance authority media are used (i.e., stamps, signatures, passwords, etc.), the wing maintains control through documented procedures IAW AFI21-101_AFMCSUP_309MXWGM21-03.

7.5.3.4. Depending on the level of traceability required by contract, regulations or other established requirements, the management information systems (e.g., Planned Depot Maintenance Scheduling System [PDMSS], Inventory Tracking System [ITS], Maintenance Overhauls and Repair Impresa System [IMPRESA], Electronic Facilities and Equipment Maintenance System [eFEMS]), and material control procedures provide the identification.

7.5.4. Customer Property:

7.5.4.1. Contractor or government furnished equipment (GFE) provided for workloads consist of parts or components, materials and equipment, to include: Industrial plant equipment (IPE) or modification kits supplied from other services or customers on a contract or DMISA workload. If these items are required by the workload or contract agreement to be segregated from AF stock, procedures are developed or revised (as necessary) to ensure the specified requirements are met. For the purpose of contract or partnering workloads, components are considered customer property. They are identified, verified, protected, and safeguarded from damage, loss or deterioration IAW AFMCI21-130; AFMAN23-220, *Reports of Survey for Air Force Property*; AFI23-111, *Management of Government Property in Possession of the Air Force*; and AFMAN23-110 Vol. 2, Part 13, Chapter 8, *Equipment Management*.

7.5.4.2. Nonconformities discovered during the maintenance process or those organically caused, will be processed as rework or condemned. When customer furnished material is found damaged, malfunctioning or otherwise unsuitable for use, the appropriate customer representative is notified for resolution, including financial accountability and records maintained. This procedure is performed according to the guidance contained in the contract and/or applicable directives.

7.5.4.3. GFE and IPE items are managed at the appropriate levels throughout the wing by equipment custodians. Their responsibilities include monitoring, tracking and periodically inventorying all assigned equipment.

7.5.5. Preservation of Product:

7.5.5.1. The wing ensures preservation of the conformity of product during internal processing. Production groups have established and maintained procedures for preservation including handling, storage, packaging, preservation, and delivery to the intended destination in order to maintain conformity to requirements. To prevent unintended use, items intended for maintenance use are segregated from items not intended for maintenance. These procedures are developed, implemented, and maintained at the production group level.

7.5.5.2. Preservation of products includes provisions for cleaning, prevention, detection and removal of foreign objects, special handling for sensitive products, marking and labeling including safety warnings, shelf life control and stock rotation, and special handling for hazardous materials.

7.5.5.3. The primary governing documents for the preservation of product are AFI21-101_AFMCSUP_309MXWGM21-03; AFI24-210_IP, *Package of Hazardous Material*; AFMCI21-117, *Corrosion Control and Prevention Program and Marking of Aerospace Equipment*; AFMCI24-201, *AFMC Packaging and Materials Handling Policies and Procedures*; AFMCI21-130; and applicable TOs.

7.6. Control of Monitoring and Measuring Equipment:

7.6.1. Control of monitoring and measuring equipment is accomplished through the AF Metrology and Calibration Program, which is responsible for the recall, tracking, scheduling and calibration of AF TMDE. The Precision Measurement Equipment Laboratory (PMEL) manages the wing's calibration program. Configuration control of computer software used in monitoring and measuring specified requirements is accomplished through the Automated Computer Program Identification Number System (ACPINS). A documented risk assessment and product recall procedure has been established for TMDE found inoperative or out of tolerance during calibration.

7.6.2. The primary governing documents for control of monitoring and measuring equipment are AFI21-101_AFMCSUP; AFI21-101_AFMCSUP_309MXWGM21-03; AFI21-113, *Air Force Metrology and Calibration (AFMETCAL) Management*; TO 00-5-16, *Software Managers and Users Manual for the USAF Automated Computer Program Identification Number System (ACPINS)*; TO 00-20-14; TO 33-1-27, *Logistic Support of Precision Measurement Equipment*; TO 33K-1-100-1, *Calibration Procedure for Maintenance Data Collection Codes and Calibration Measurement Summaries*; TO 33K-

1-100-2, *TMDE Calibration Interval Technical Order and Work Unit Code Reference Guide*; and/or applicable CMS.

8. Measurement, Analysis and Improvement:

8.1. The 309 MXW uses multiple internal/external audit sources. Maintenance Standardization Evaluation Program (MSEP) and DRs are used for demonstrating conformity to product requirements. Results of these audits are recorded/tracked in QIMSS and JDRS. Higher headquarters conducts Unit Compliance Inspection (UCIs) and Logistics Compliance Assessment Program (LCAP) inspections to provide an external review of our processes. All nonconformances are compiled into a single repository to enable holistic review and response. Nonconformities are trended using the data, information, knowledge, and wisdom (DIKW) hierarchy and referred to leadership for review during PMRs and QMRs. Leadership bases their decisions on factual data and determines what, if any, actions are required. Data analysis and follow-up inspections validate effectiveness of corrective and preventive actions and conformance with the management system.

8.2. Monitoring and Measurement:

8.2.1. Customer Satisfaction:

8.2.1.1. DREP meetings are used to discuss the top 10 problem items determined using the EXPRESS Data Toolkit Supportability Summary Report. The review will consist of the items with the highest sort value that have failed. Additional items that cannot be produced may be added to the list. Additional items could include mission incapable (MICAP) parts status, delivery constraints, quarterly demand rate (QDR), repair objectives, AFMC Forms 202, action items, and issues impeding production. In addition to the top 10 problem items, the meeting will also include a status of parts driving items in an awaiting parts status (AWP) and all hangar queens compiled by production element. Production history and customer demand rates are used as a measure of customer satisfaction. Analysis of this data is reviewed by leadership to make effective decisions for short-term results and drive process changes for long-term correction of problems. Customer driven performance measures are one of the key tenets of DREP. Maintenance standardization is required to ensure greater effectiveness, improved quality and provide a single face to our customers. DREP meeting minutes are kept up to 1 year for audit purposes. Meeting minutes must include a graded rating for measurement of customer satisfaction.

8.2.1.2. The primary governing documents for monitoring and measurement of customer satisfaction are TO 00-35D-54, AFMCI21-129, and AFMCI21-127.

8.2.2. Internal Audit (IA):

8.2.2.1. The IA program establishes, by unbiased means, factual information on the quality of the wing's execution. These audits ensure the management system is effectively implemented, maintained and conforms to the requirements established by the AF, AFMC, 309 MXW instructions, and the AS9100C and AS9110A standards. Senior leadership will utilize results of audits in management reviews to assess the efficiency, effectiveness, conformance and compliance, and apply necessary actions and resources to continually improve the management system and enhance customer satisfaction.

8.2.2.2. The IA program consists of various inspection programs specific to the portion of the management system under review (e.g., QP, SQIP, safety, environmental, and management system audits). Process review (PRs), BCIEs, quality verification inspection (QVIs), PEs, and routine inspection list (RILs) are examples of the methods used to evaluate the product and processes. When process nonconformities occur, effects to related product and processes are evaluated. Internal system auditors assess the management processes for compliance and effectiveness, and report to wing leadership for necessary actions. The documented procedures governing each inspection/audit type, records, and methods for monitoring and measuring are defined in the applicable DoD, AF, AFMC, wing, or group instructions. These instructions include procedures to define responsibilities and requirements for planning/conducting audits, establishing/maintaining records, and reporting results.

8.2.2.3. The primary governing documents for IAs are AFI90-201_AFMCSUP, *Inspector General Activities*; AFI21-101_AFMCSUP_309MXWGM21-03; and AFI90-803, *Environmental, Safety, and Occupational Health Compliance Assessment and Management Program*.

8.2.3. Monitoring and Measurement of Processes:

8.2.3.1. The wing monitors and measures processes using suitable methods such as BCIEs, PRs, MSEP, SQIP, and system audits to confirm the ability of the processes to achieve planned results. When planned results are not achieved, the corrective/preventive action process is initiated.

8.2.3.2. The primary governing documents for monitoring and measurement of processes are AFI21-101_AFMCSUP_309MXWGM21-03 and AFI90-201_AFMCSUP.

8.2.4. Monitoring and Measurement of Product:

8.2.4.1. The 309 MXW monitors and measures the characteristics of products to verify that product requirements have been met and is carried out at appropriate stages of the product realization process, IAW the appropriate technical data. The technical data provides the criteria for acceptance or rejection. The WCDs/WADs identify the sequence of measurement and testing operations, provides a record of measurement results, and identifies which operations require secondary approval. The WCDs/WADs are the objective evidence and records that all maintenance, customer, and product requirements have been met, and indicates the personnel authorized to release the product to the customer.

8.2.4.2. The primary governing documents for monitoring and measurement of product are AFMCI21-156 and AFI21-101_AFMCSUP_309MXWGM21-03.

8.3. Control of Nonconforming Product:

8.3.1. Products that do not conform to requirements are identified and controlled to prevent their unintended use or delivery. Necessary actions are taken to contain the effect of the nonconformity on other processes and products. Non-conforming product is defined as any component, material, part, sub-assembly or product in which one or more

characteristics that does not conform to the requirements in the specifications, drawing, technical data, applicable product description or contract requirement. The term “nonconforming product” includes nonconforming product returned from a customer and may include intellectual product or property. Nonconforming product is identified as, but not limited to: scrap material, condemned, due-in from maintenance (DIFM), and unserviceable. The documented procedures define the responsibility and authority for the review, reporting, records management, disposition of nonconforming product, and the processes for approving personnel making these decisions. These procedures are included in the applicable DoD, AF, AFMC, wing or group instructions.

8.3.2. The primary governing documents for control of nonconforming product are 309MXWI23-103, *Scrap Material Reclamation Function (SMRF)*; 309MXWI23-102, *Depot Maintenance Activity Group (DMAG) Owned Material Management*; TO 00-35D-54; and AFMCI21-130.

8.4. Analysis of Data:

8.4.1. Data is collected from AF maintenance information systems and databases by analysts assigned to their associated areas of the management system to assess suitability and effectiveness. Senior leadership reviews data and recommendations provided to determine where continual improvement can be made. Systems used to collect data for analysis include, but are not limited to, JDRS, QIMSS, and Maintenance 1 database. Data collected reflecting human factors are obtained through the use of polls, conducted periodically by an independent organization, which is analyzed and assessed in management reviews. The 309 MXW Work Force Council provides a conduit that allows the work force to communicate their suggested improvements and have those ideas addressed and resolved by senior leadership.

8.4.2. Suppliers’ regulated data may be gathered, reviewed, analyzed, and controlled by outside sources (such as DCMA, program offices and base contracting).

8.4.3. The primary governing documents for analysis of data are AFI21-101_AFMCSUP and TO 00-35D-54.

8.5. Improvement:

8.5.1. Continual Improvement: Improvement activities take place through the use and application of the AMQS quality policy, wing goals, internal and external audit results, data analysis, corrective and preventive actions, AF Smart Operations for the 21st Century (AFSO21) events, and management reviews. The implementation of improvement activities is monitored and evaluated for effectiveness through IAs and management reviews. 309 SMXG utilizes the CMMI for Development for Continual Process Improvement and the Standard CMMI Appraisal Method for Process Improvement (SCAMPI) methodology for appraisals.

8.5.1.1. The primary governing documents for continual improvement are AFI20-111, *Logistics Compliance Assessment Program (LCAP)*; AFI21-101_AFMCSUP; AFI21-101_AFMCSUP_309MXWGM21-03; the Air Force Smart Operations for the 21st Century Playbook; AFMCI63-510_HILLAFBSUP; HILLAFBMAN63-501; AFMCI90-104, *Implementing AFSO21 Initiatives*; AFI33-114, *Software Management*; and AFI33-114_AFMCSUP_1, *Software Management Procedures*.

8.5.2. Corrective Action Process: This section establishes policies, guidance, procedures, and responsibilities for operation of the corrective action process. This process is intended to eliminate the causes of nonconformities by making corrections to the processes of the management system.

8.5.2.1. Objective: To establish the corrective action process for all levels of the wing. **NOTE:** Any deviation from this instruction requires a documented process that fully complies with current AS9100C and AS9110A standards.

8.5.2.2. Scope: All wing organizations.

8.5.2.3. Responsibilities:

8.5.2.3.1. Process Owner: The appropriate level vice commander/deputy director is the designated owner for the corrective action process.

8.5.2.3.1.1. Assigns an individual to serve as the corrective/preventive action coordinator (C/PAC) at the equivalent level.

8.5.2.3.1.2. Directs necessary correction and containment activities.

8.5.2.3.1.3. Initiates CAR.

8.5.2.3.1.4. Identifies subject matter expert (SME) to work CAR.

8.5.2.3.1.5. Approves/disapproves proposed corrective action plan (CAP).

8.5.2.3.1.6. Ensures the CAP is implemented by specified date.

8.5.2.3.1.7. Approves/disapproves verification results and authorizes closure of CAR if approved.

8.5.2.3.2. C/PAC:

8.5.2.3.2.1. Initiates CAR in Maintenance 1 database, and updates database throughout the life of the CAR using information provided by the team lead (TL) and scribe.

8.5.2.3.2.2. Coordinates initial CAR meeting.

8.5.2.3.2.3. Ensures a TL and scribe are assigned from members during initial meeting.

8.5.2.3.2.4. Tracks and monitors CAR activity, notifies leadership of CAR progress, delinquent actions, and close-out.

8.5.2.3.2.5. Disapproves insufficient or incomplete CARs and returns them to the TL for revision.

8.5.2.3.2.6. Inputs disputes as to the CAR validity into the comment section of the Maintenance 1 database, and escalates unresolved disputes to the process owner.

8.5.2.3.2.7. Closes CAR in Maintenance 1 database upon completion of activities.

8.5.2.3.3. TL:

8.5.2.3.3.1. Organizes, coordinates, and sets team agenda including frequency of meetings, times, and meeting location.

8.5.2.3.3.2. Manages the documents, collected data, records, and reports needed or generated by the team.

8.5.2.3.3.3. Briefs status of team's activities to C/PAC and leadership.

8.5.2.3.3.4. Directs disputes as to the validity (inappropriate to problem, incorrectly assigned, etc.) of an issued CAR to the C/PAC with justification for the change.

8.5.2.3.3.5. Remains as TL until close-out of CAR.

8.5.2.3.4. Scribe:

8.5.2.3.4.1. Maintains records of attendance, takes meeting minutes, collects and consolidates team activities for inclusion into the AFSSO21 8-Step OODA Loop Process (A3) ([Attachment 5](#)).

8.5.2.3.4.2. Forwards records and information to C/PAC for entry into the Maintenance 1 database.

8.5.2.3.4.3. Works with TL as needed to facilitate team meetings.

8.5.2.3.5. Corrective/Preventive Action Flow ([Attachment 6](#)):

8.5.2.3.5.1. A non-conformance is identified (309 MXW IA, 2d Party, 3d Party, management review output, customer complaint, bucket list, BCIEs, SQIP, etc.). For nonconformities identified during quality assurance inspections refer to paragraph 8.5.2.3.7.

8.5.2.3.5.2. The C/PAC determines appropriate scope of CAR with process owner.

8.5.2.3.5.3. The process owner directs necessary correction and containment activities.

8.5.2.3.5.4. The C/PAC requests SMEs to serve as members of the corrective action team, and requests a trained facilitator to guide the team through the 8-Step OODA Loop process. A3 flow and interaction diagram ([Attachment 7](#)) shows the interaction of the OODA Loop steps.

8.5.2.3.5.5. The C/PAC enters CAR in Maintenance 1 database.

8.5.2.3.5.6. The process owner assigns SMEs as appropriate.

8.5.2.3.5.7. The C/PAC coordinates initial team meeting, and ensures TL and scribe are assigned.

8.5.2.3.5.8. The corrective action team determines root cause utilizing AFSSO21 tools. From the analysis of collected data, the team develops the CAP recommendations ([Attachment 5](#), steps 1-6).

8.5.2.3.5.9. As a step to be considered for each issued CAR, the corrective action team determines if additional nonconforming product exists based on the causes of the nonconformities. If further action is required, the team

defines the area of scope and the specific action.

8.5.2.3.5.10. Using an A3, the TL presents corrective action plan recommendations to the process owner for approval/disapproval. If the recommended action plan is disapproved, the plan is returned to the corrective action team for additional analysis and development of an updated plan.

8.5.2.3.5.11. If approved, the process owner ensures implementation of the recommended corrective actions and will be informed of completion IAW paragraph 8.5.2.3.2.4.

8.5.2.3.5.12. The TL routinely notifies C/PAC of implementation status and verification results until CAR is ready to be closed and completes the remainder of the A3 (**attachment 5**, steps 7-8).

8.5.2.3.5.13. The C/PAC closes the CAR in the Maintenance 1 database after verification of effectiveness has been accomplished (see paragraph 8.5.2.3.6.11).

8.5.2.3.6. Reporting Requirements:

8.5.2.3.6.1. The TL provides C/PAC a response in the form of an action plan within 15 calendar days from the date of CAR issuance.

8.5.2.3.6.2. At any time within the 15-day period, the TL may request a time extension via email to the C/PAC. Requests for extension will include sufficient justification and corresponding milestones to support the request. The C/PAC is the approval authority for a first time request.

8.5.2.3.6.3. Additional requests for time extensions are made by TL to the C/PAC, with a notification to the process owner. Requests are made via email and will include sufficient justification and new milestones. The process owner is the approval authority for additional extension requests.

8.5.2.3.6.4. If an extension request is disapproved, the CAP due date will not change.

8.5.2.3.6.5. If the CAP has not been submitted within 15 calendar days of CAR issuance and an extension has not been granted, the C/PAC will send a notification via email to the TL requesting submission of the plan within 5 calendar days.

8.5.2.3.6.6. If after 5 calendar days the recommendation has not been submitted, a notification will be sent via email to the TL and process owner. Further action regarding the CAR is determined by the process owner.

8.5.2.3.6.7. The C/PAC will enter notification emails in the comment section of the Maintenance 1 database.

8.5.2.3.6.8. When timely and/or effective corrective actions are not achieved, the C/PAC will notify the TL and process owner via email.

8.5.2.3.6.9. When as a result of causal analysis it is determined a supplier is responsible for the root cause, a flow down of the corrective action to the

responsible supplier is initiated.

8.5.2.3.6.10. Based on the results of the causal analysis, the need for action based on human factors is evaluated to ensure the nonconformities do not recur.

8.5.2.3.6.11. Approximately 90-180 days after implementation, a verification of the effectiveness of the corrective action is accomplished by the appropriate oversight authority (e.g. QA, system auditors, safety). Follow up actions will be recorded in the comment section of the Maintenance 1 database. **NOTE:** Other than wing-level, verification will be determined by the process owner.

8.5.2.3.7. Quality Assurance Inspections: Records of quality assurance inspections are maintained in the QIMSS database.

8.5.2.3.7.1. In those areas where quality assurance inspections with findings result in the generation of an AFMC Form 343, *Quality Assurance Assessment*, the answer to the nonconformance is considered a remedial correction; that is to say, the incident identified may or may not require a complete AFSO21 8-Step OODA Loop process. The process owner determines if the issue requires a complete 8-step OODA Loop based on the complexity and scope of the cause.

8.5.2.3.7.2. Recipient of the AFMC Form 343 with findings will conduct a causal analysis (i.e. 5-Why process as a minimum, which is documented on the AFMC Form 343) and develop a corrective action plan based on the analysis appropriate to the effects of the nonconformance encountered. Response given to correct the nonconformance must have a record of actions taken. Records shall remain legible, readily identifiable and retrievable.

8.5.3. Preventive Action Process: This section establishes policies, guidance, procedures and responsibilities for operation of the preventive action process. This process is intended to eliminate the causes of potential nonconformities by making improvements to the processes within the management system. **NOTE:** Examples of preventive action opportunities include risk management, error proofing, failure mode and effect analysis (FMEA), and information on product problems reported by external sources.

8.5.3.1. Objective: To establish the preventive action process for all levels of the wing. **NOTE:** Any deviation from this instruction requires a documented process that fully complies with current AS9100C and AS9110A standards.

8.5.3.2. Scope: All wing organizations.

8.5.3.3. The 309 MXW determines actions to eliminate the causes of potential nonconformities in order to prevent their occurrence. Preventive actions are appropriate to the effects of the potential problems. The preventive action process is identical to the corrective action process.

Allan E. Day, Colonel, USAF
Commander, 309th Maintenance Wing

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Abbreviations and Acronyms

ACPINS—Automated Computer Program Identification Number System

AF—Air Force

AFB—Air Force Base

AFH—Air Force Handbook

AFI—Air Force Instruction

AF IMT—Air Force Information Management Tool

AFMAN—Air Force Manual

AFMC—Air Force Materiel Command

AFMCI—Air Force Materiel Command Instruction

AFMCSUP—Air Force Materiel Command Supplement

AFMETCAL—Air Force Metrology and Calibration

AFOSH—Air Force Occupational Safety & Health

AFPAM—Air Force Pamphlet

AFSO21—Air Force Smart Operations for the 21st Century

AFTO—Air Force Technical Order

AMQS—Aerospace Maintenance Quality System

ATE—Automated Test Equipment

ATIMS—Automated Technology Information Management System

AWP—Awaiting Parts

BCIE—Baseline Compliance Improvement Event

C/PAC—Corrective/Preventive Action Coordinator
CAP—Corrective Action Plan
CAR—Corrective Action Request
CC—Commander
CMMI—Capability Maturity Model Integration
CMS—Calibration and Measurement Summary
COTS—Commercial-Off-the-Shelf
CPI—Continuous Process Improvement
CTP—Civilian Training Plan
DCMA—Defense Contract Management Agency
DIKW—Data, Information, Knowledge, and Wisdom
DIFM—Due-In from Maintenance
DMAG—Depot Maintenance Activity Group
DMISA—Depot Maintenance Inter-service Support Agreement
DoD—Department of Defense
DR—Deficiency Report
DREP—Depot Repair Enhancement Process
DV—Vice Director
eFEMS—Electronic Facilities and Equipment Maintenance System
ESOH—Environmental, Safety, and Occupational Health
ETIMS—Enhanced Technical Information Management System
ETR—Electronic Training Record
FMEA—Failure Mode and Effect Analysis
FOD—Foreign Object Debris
GFE—Government Furnished Equipment
GLSC—Global Logistics Support Center
GM—Guidance Memorandum
IA—Internal Audit
IAW—In Accordance With
IMPRESA—Maintenance Overhaul and Repair Impresa System
IPE—Industrial Plant Equipment
IPP—Integrated Project Plan

ITS—Inventory Tracking System

JDRS—Joint Deficiency Reporting System

JEDMICS—Joint Engineering Data Management Information and Control System

LCAP—Logistics Compliance Assessment Program

MICAP—Mission Incapable

MIL—HDBK - Military Handbook

MOA—Memorandum of Agreement

MOU—Memorandum of Understanding

MSEP—Maintenance Standardization Evaluation Program

MXWI—Maintenance Wing Instruction

NDI—Nondestructive Inspection

OJT—On-the-Job Training

OO—ALC - Ogden Air Logistics Center

OPR—Office of Primary Responsibility

OSHA—Occupational Safety and Health Administration

PAC—Production Acceptance Certification

PAR—Preventive Action Request

PD—Policy Directive

PDMSS—Planned Depot Maintenance Scheduling System

PE—Personnel Evaluations

PMEL—Precision Measurement Equipment Laboratory

PMR—Program Management Review

PODDS—Process Order Development and Display System

PPE—Personal Protective Equipment

PPG—Project Process Guide

PPPT—Pre-production Planning Team

PPT—Production Planning Team

PR—Process Review

QA—Quality Assurance

QDR—Quarterly Demand Rate

QIMSS—Quality Information Management Standard System

QMR—Quality Management Review

QP—Quality Program
QVI—Quality Verification Inspection
RDS—Records Disposition Schedule
RIL—Routine Inspection List
RMS—Resource Management System
SCAMPI—Standard CMMI Appraisal Method for Process Improvement
SCP—Support Center Pacific
SEP—Standard Engineering Process
SME—Subject Matter Expert
SMIC—Strategic Missile Integrated Complex
SOJT—Structured On-the-Job Training
SORA—Source of Repair Assignment
SPO—System Program Office
SQIP—Squadron Inspection Program
SSP—Standard Support Processes
TL—Team Lead
TMDE—Test Measurement and Diagnostic Equipment
TO—Technical Order
TSS—Training Scheduling System
UCI—Unit Compliance Inspection
WAD—Work Authorization Document
WCD—Work Control Document
309 AMARG—Aerospace Maintenance and Regeneration Group
309 AMXG—Aircraft Maintenance Group
309 CMXG—Commodities Maintenance Group
309 EMXG—Electronics Maintenance Group
309 MMXG—Missile Maintenance Group
309 MXSG—Maintenance Support Group
309 SMXG—Software Maintenance Group
309 MXW—Maintenance Wing
309 MXW/OB—Business Operations
309 MXW/EN—Engineering

309 MXW/QP—Quality Program***Terms***

AMQS— 309 MXW quality management system that establishes and maintains a standardized approach to achieve excellence in supporting the maintenance mission through a focus on process certification, process surveillance, and configuration management. AMQS drives and requires leadership involvement and engagement at all levels to ensure its success. AMQS enables our organization to perform aerospace maintenance with defined, controlled, and repeatable processes, using a systems approach developed by the wing.

Configuration Management— The method to ensure specifications and resulting products are consistent and equal and ensures product integrity is maintained.

Containment— Action to control and mitigate the impact of a nonconformity and protect the operation (stop the problem from getting worse); includes correction, immediate corrective action, immediate communication, and verification that the nonconforming situation does not further degrade.

Correction— Immediate action(s) taken to eliminate a detected nonconformity.

Corrective Action— Action to eliminate the causes of nonconformities in order to prevent recurrence.

Leadership— Supervisors at all levels of the organization to include senior leadership.

Maintenance 1— A database owned by the 309 MXW for capturing, managing and recording the results of squadron self-inspections, corrective actions, and preventive actions.

Memorandum of Agreement (MOA), Memorandum of Understanding (MOU)— Document stating requirements, deliverables and expectations agreed upon by two or more organizations.

Nonconformity— A finding that states the non-fulfillment of a requirement pertaining to policy, process and/or product.

Opportunities for Improvement— An observation which documents a case, in which a reviewed organization is progressing with regard to a change or improvement, but has not fully implemented the improvement; a suggestion for improvement; a suggestion for sharing best practices.

Plan— How an organization intends to accomplish, deliver or produce their objective.

Policy—Document that states management's overall intentions to fulfill requirements.

Preventive Action— Preventive actions are steps that are taken to remove the causes of potential nonconformities or potential situations that are undesirable. The preventive action process is designed to prevent the occurrence of nonconformities or situations that do not yet exist. It tries to prevent occurrence by eliminating causes. While corrective actions prevent recurrence, preventive actions prevent occurrence. Both types of actions are intended to prevent nonconformities. Preventive actions address potential problems, ones that haven't yet occurred. In general, the preventive action process can be thought of as a risk analysis process.

Procedures— Specified way to perform an activity.

Record— Project artifact, (proof of compliance).

Remedial Correction— An action taken to alleviate the symptoms of existing nonconformities or any other undesirable situation.

Root Cause— One of multiple factors (events, conditions or organizational factors) contributing to or creating the immediate cause and resulting unwanted outcome. If the cause is eliminated or modified, it would prevent the unwanted outcome. Typically multiple root causes contribute to an unwanted outcome.

Root Cause Analysis— A structured evaluation method for identifying root causes of an unwanted outcome and the effective actions to prevent recurrence. Root cause analysis should continue until organizational factors have been identified or until research of the causal factors are exhausted.

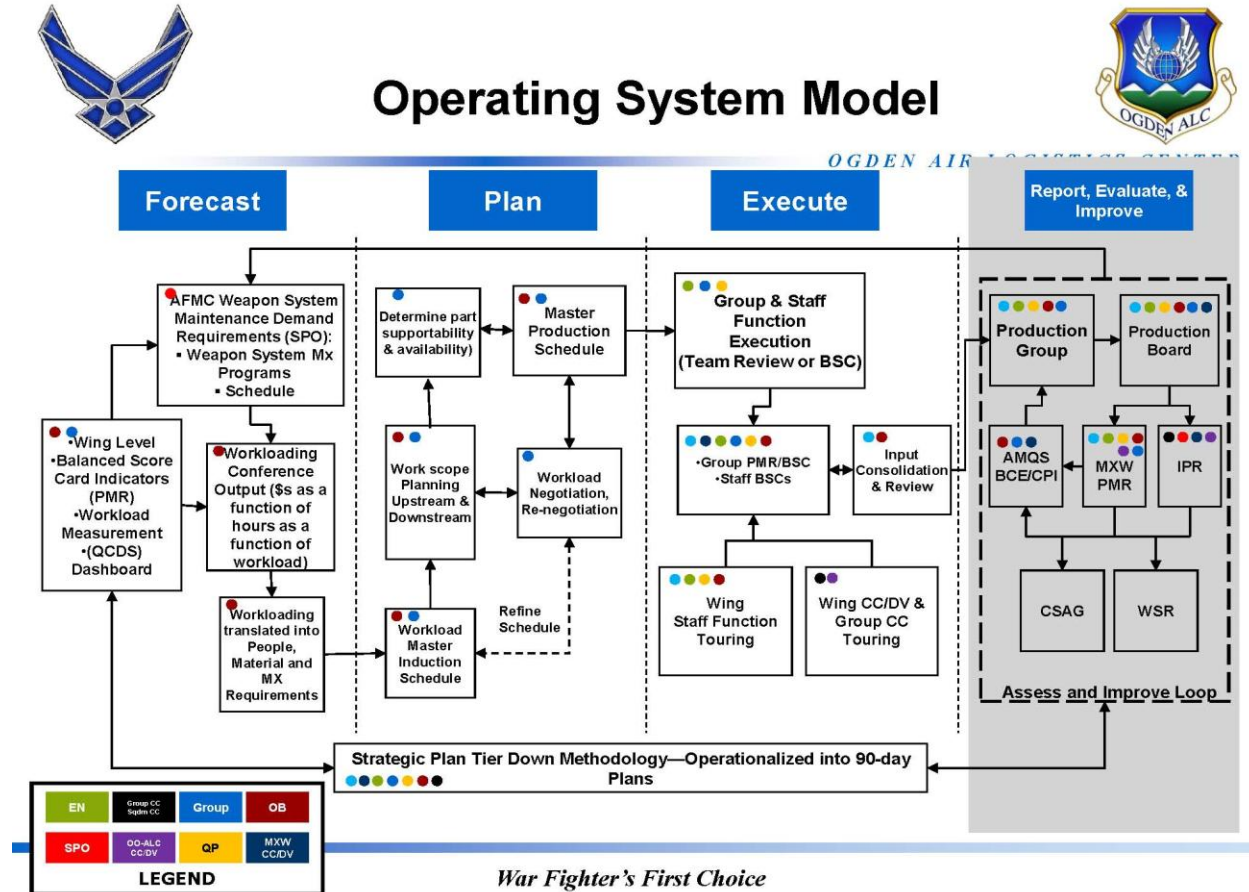
Rough Order of Magnitude— Preliminary cost and schedule estimate given to the customer for a proposed workload.

Senior Leadership— Senior leadership is comprised of the 309 MXW CC and DV, group commanders/directors, group vice commanders/deputy directors, and wing staff office directors/chiefs.

Attachment 2

309 MXW OPERATING SYSTEM MODEL

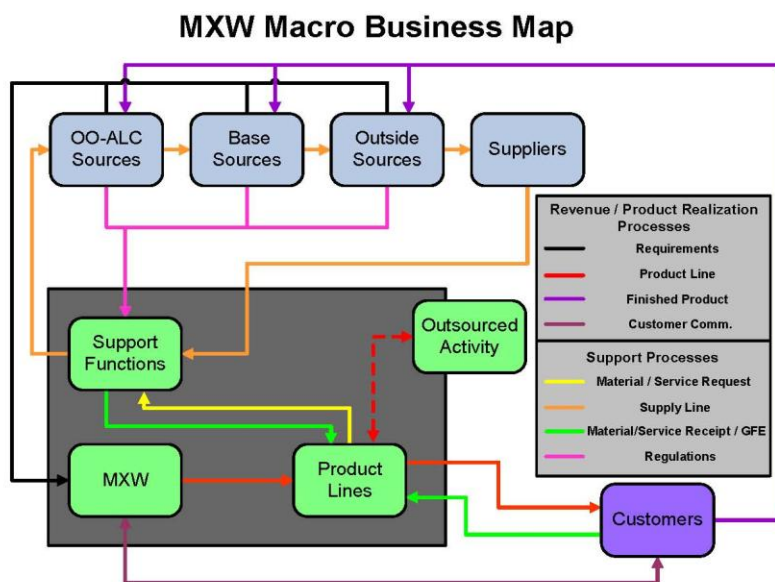
Figure A2.1. 309 MXW Operating System Model



Attachment 3

309 MXW MACRO BUSINESS MAP

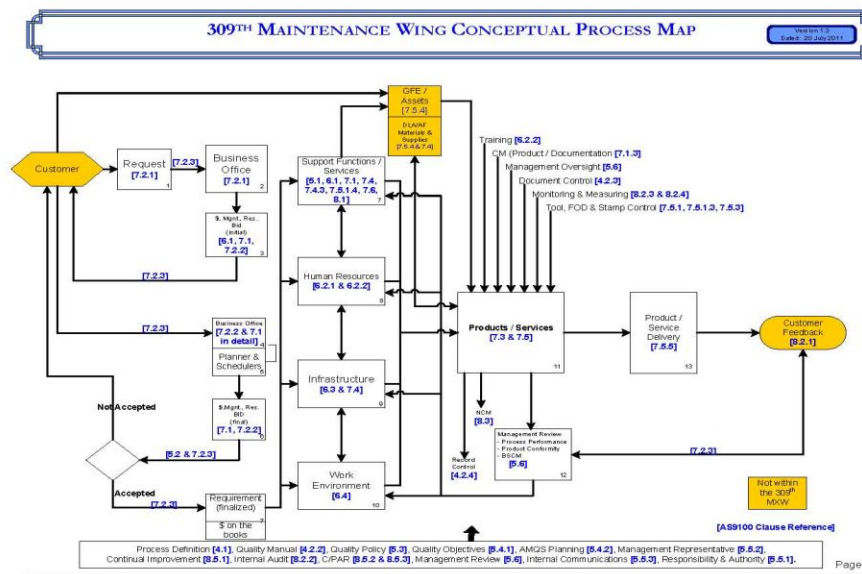
Figure A3.1. 309 MXW Macro Business Map



Attachment 4

309 MXW PROCESS FLOW WITH AS9100C REQUIREMENTS

Figure A4.1. 309 MXW Process Flow With AS9100C Requirements



Attachment 5

AFSO21 8-STEP PROBLEM SOLVING OODA LOOP (A3)

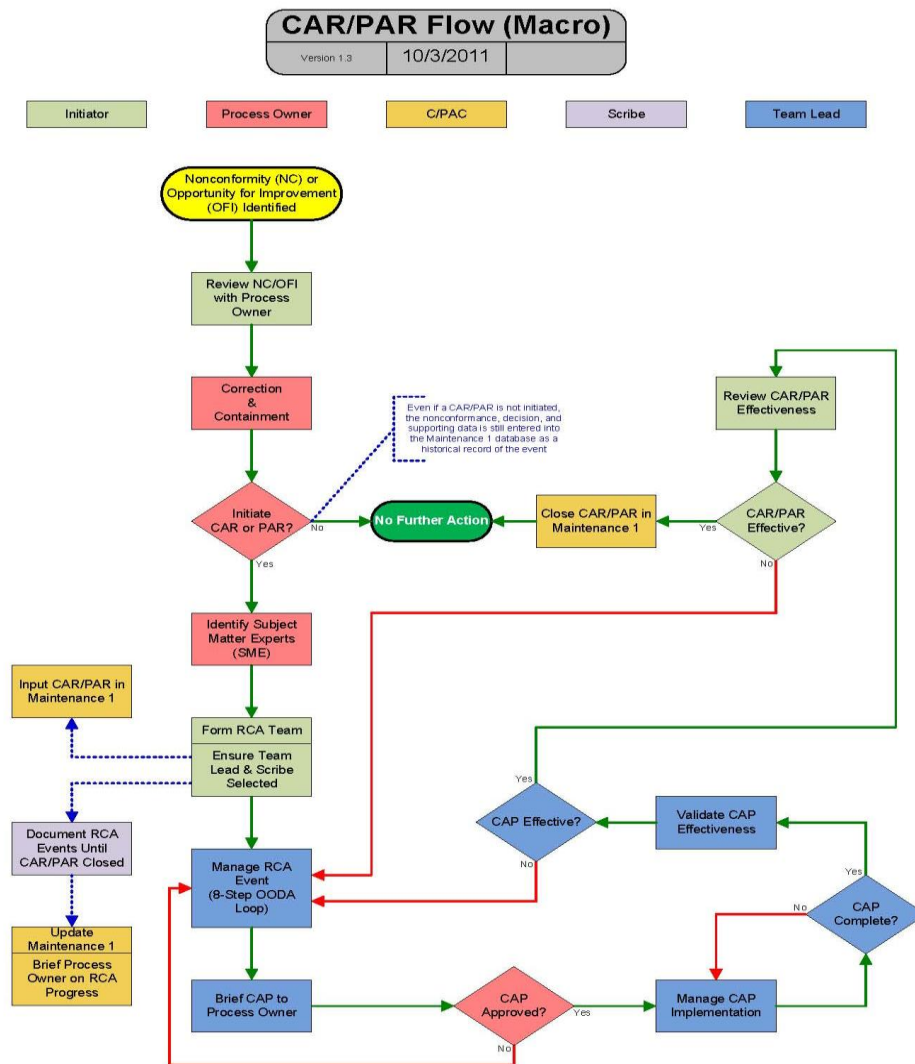
Figure A5.1. AFSO21 8-Step Problem Solving OODA Loop (A3)

Team Members:	AFSO21 Problem Solving Process OODA - Observe, Orient, Decide, & Act 8-Step Problem Solving Model		Approval Information Signatures
1. Clarify & Validate the Problem ☺ ○ □ D A	4. Determine Root Cause ○ ☺ □ D A		6. See Countermeasures Through ○ ○ □ D A
2. Break Down the Problem/Identify Performance Gaps ☺ ○ □ D A	5. Develop Countermeasures ○ □ D A ☺		7. Confirm Results & Process ○ ○ □ D A
3. Set Improvement Target ○ ☺ □ D A			8. Standardize Successful Processes ○ ○ □ D A

Attachment 6

CORRECTIVE/PREVENTIVE ACTION FLOW

Figure A6.1. Corrective/Preventive Action Flow



Attachment 7

A3 FLOW AND INTERACTION DIAGRAM

Figure A7.1. A3 Flow and Interaction Diagram

